3

Business & Economic Development
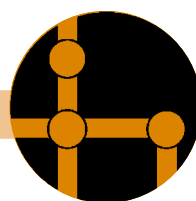

Access   **Content**   **Diversity**   **Infrastructure**   **Literacy**

Nowhere is the impact of information technology on our region clearer than in the growth of the IT industry over the past decade. As one of the strongest economic sectors in our region, software, computer, and telecommunications services have contributed greatly to a generally healthy economy. Even taking into account the slow-downs in this sector from the end of 2000 into 2002, these industries still enjoyed major growth throughout the course of the last decade.

The IT industry's impact on community quality is very broad. Wage data from the state shows that jobs in information technology occupations pay, even in the lowest quartile, much higher than what is considered a living wage. The information technology industry employs a wide variety of types of positions, including manufacturing, administrative, technical, and professional workers. The incredible growth and profit of this sector has also positively impacted non-profit and community organizations, who have benefited from the generosity of both companies and individuals.

A healthy economy is fundamental to maintaining Seattle's quality of life, and the information technology industry continues to play a large role in the strength of our economy locally, regionally, and nationally. This section examines the impact that information technology is having in the following business and economic development areas:

1. Industry: What is the state of the information technology industry in our area and what is the extent of information technology jobs in all industries?

2. Workforce: Are we sufficiently developing a local workforce for employers to draw from and are they hiring locally? Are we developing IT innovators and leaders as well as technicians? How is the workforce changing?

3. Supporting small local business. To what extent is the Internet used to support local business? Are small businesses adopting computers and the Internet effectively to support their sustainability and growth?

Defining the Information Technology Industry and Information Technology Occupations

Defining the Information Technology Industry and those who work as "Information Technology Professionals" within the confines of the current Federal and State industry and occupational classification systems poses a challenge for anyone hoping to present an accurate picture of the economic impact that IT is having on our region. There are significant limitations in both the industry and the occupational data available.

INDUSTRY

All companies in the United States are categorized into industries using a system of Standard Industrial Classification Codes (SIC Codes).[1] These codes are used to group similar companies together based on the type of work that they do, and most federal and state data on employment is reported using these codes. This system is updated infrequently and therefore does not necessarily reflect changes in the industry, however using this system in creating definitions does insure that consistent federal and state data will be available over time.

In creating the definition of the Information Technology industry used in this report, we consulted high-tech industry definitions and talked with economic development experts at the City and State level, as well as with staff at the Puget Sound Regional Council, the WSA (formerly the Washington Software Alliance), and the Northwest Policy Center at the University of Washington. For the purpose of this report, the information technology industry in our region is defined as firms in the industry sectors listed at right.

The limitation of any list based on SIC codes is that many of the "new economy" companies that we think of as being part of the information technology industry are classified under the service they provide (such as consulting) or as retail industries, and therefore are not included in this industry grouping. Without looking at all companies on a case-by-case basis, grouping all of the information technology industries within the confines of the current classification system is impossible.

Communication Services

4812	Radiotelephone Communications
4813	Telephone Communications
4822	Telegraph and Other Message Communications
4832	Radio Broadcasting Stations
4833	Television Broadcasting Stations
4841	Cable and Other Pay Television Services
4899	Other Communication Services

Software and Computer Related Services

7371	Computer Programming Services
7372	Prepackaged Software
7373	Computer Integrated Systems Design
7374	Computer Processing and Data Preparation
7375	Information Retrieval Services
7376	Computer Facilities Management Services
7378	Computer Maintenance and Repair
7379	Computer-Related Services, NEC (not elsewhere classified)

OCCUPATIONS

There are similar challenges in classifying Information Technology Occupations. On a Federal and State level, occupations are categorized using occupational titles.[2] Jobs are changing faster than the Federal and State government are able to alter the classifications, causing estimates of IT professionals based on this type of data to be lower than the actual number working in IT jobs.

This report focuses on the core information technology workforce as defined by the U.S. Department of Commerce Office of Technology Policy.[3]

Using the Dictionary of Occupational Titles, the core IT professions are found in the following occupations:

22127	Computer Engineers
25102	Systems Analysts
25103	Database Administrators
25104	Computer Support Specialists
25105	Computer Programmers
25108	Computer Programmer Aides
25199	Computer Scientists, NEC
34005	Technical Writers[4]

Workforce Needs: Computer Literacy and Employment

In order to maintain a healthy economy, business and individual workers need computer skills. For many businesses, computers are already an integral part of their work environment, and employees are expected to be able to use computers for internal and external communication and for completing their own work-related tasks. Although some on-the-job training may be provided, an increasing number of new employees are expected to arrive on day one with some level of basic technology literacy. In a 1998 Benton Foundation Report, the then Assistant Secretary of Commerce for Communications and Information stated that by the year 2000, 60 percent of all jobs would require some skills with technology.[5]
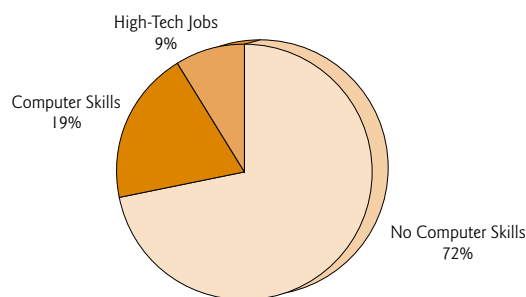
Globalization has created new opportunities for companies and businesses to employ workers at much lower rates outside of the U.S. Technology, and the productivity that it has brought, has rendered some other jobs obsolete. In order to secure a job that will pay a wage sufficient to support a family, workers need to come to the table with more skills. Measuring the number of jobs that require basic computer literacy helps to define the importance of providing training and life-long learning opportunities for all residents.

Measurement

Percentage of *Seattle Times/P-I* Classified Ads that mention computer skills as a pre-requisite for employment

28%

PERCENTAGE OF EMPLOYMENT CLASSIFIED ADS THAT SPECIFY COMPUTERS SKILLS AS A PRE-REQUISITE FOR EMPLOYMENT

High-Tech Jobs 9%
Computer Skills 19%
No Computer Skills 72%

April 30th, 2000

High-Tech Jobs 6%
Computer Skills 22%
No Computer Skills 72%
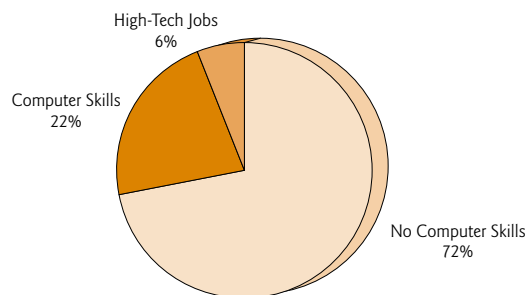
December 3, 2000

Source: *Seattle Times/Post-Intelligencer* Classified Ads

More than three-quarters of the classified ads made no mention of computer skills or specific computer programs as a requirement for the advertised job, though it is difficult to gauge non-advertised skill expectations. In some cases, jobs may not require those skills. In other cases, companies may not have mentioned computer skills in their ads, but may still expect serious applicants to have computer skills. In order to get a better picture of employers' expectations, some follow-up would be necessary.

• In general, the number of classified ads that specify computer skills as a prerequisite for employment was consistent in the April 2000 classifieds and in the December 2000 classifieds.

• Overall, there were far fewer classified ads in the December 2000 sample than there were in April 2000, although the percentages requiring computer skills remained virtually the same.

• There was a noticeable decrease (35%) in the number of high tech jobs advertised in December 2000, as compared to those advertised in April 2000. This may be a result of the slowing of the technology sector seen in late 2000.

Workforce Needs: Education

A healthy local economy creates jobs and growth opportunities for the community, while the community provides the workforce needed to meet the growth of the economy. Both pieces need to be in place—the local industry providing jobs, and the community providing the people to fill those jobs. There are concerns about how well the region is meeting its workforce needs locally. Many of the new jobs created by the growth in the software and computer industry need specialized skills training. If successful, the community and technical colleges, university system and other training centers offer needed certificate programs, and undergraduate and advanced degrees in computer science and related IT fields. Focusing on how well our universities and colleges are doing to meet workforce demand and the interest in technology related careers by graduating high school students provides some measure of the region's ability to sustain the growth of the economy using local resources and local people.

Measurement

Percentage of Washington high school students identifying computer or information science as their primary academic interest when taking the SAT

6%

ACADEMIC INTERESTS OF WASHINGTON STUDENTS TAKING THE SAT'S
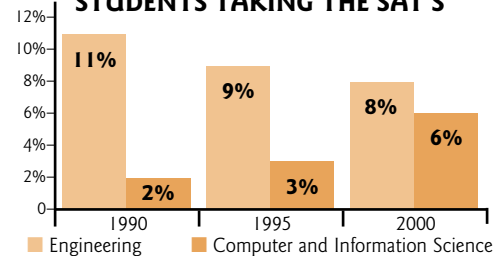

Source: The College Board[6]

When 11th and 12th grade students take the SAT in preparation for college, they are asked to identify their academic interests and possible future course of study. This data is collected by the College Board, the organization that creates and oversees the SAT and Advanced Placement tests, as an indication of the academic interests of college bound students.

The number of high school students in Washington identifying computer and information sciences as their main academic interest has more than doubled in the last decade. Despite this growth in interest, it still represents only a small percentage of high school students.

Interest in engineering is decreasing, while interest in computer and information sciences is increasing. Although the total number of

students identifying these two high technology fields as their main academic interest increased between 1990 and 2000, the overall increase was only one percent (13% to 14%).

Washington universities and colleges are not graduating enough students in technology related fields to fill the current or projected demand for technology workers within the state, According to the Washington State 2000–2001 Workforce Study released by a local trade association, the WSA (formerly the Washington Software Alliance).[7] These two indicators look at the number of students graduating from Washington schools with degrees in information technology related fields, and the

We should have a sense of urgency when it comes to our youth. All of our programs are built on the idea that all students will either be users of technology, producers of technology, or inventors of technology.

—Trish Millines-Dziko, Technology Access Foundation (TAF)

<table>
<tr><td colspan="2">**Measurement**</td></tr>
<tr><td>Projected new technical positions due to software and Internet industry employment expansion between 2000 and 2002</td><td>**12,000**</td></tr>
<tr><td>Number of 2000 graduates from Washington state universities and colleges with IT related degrees or certificates</td><td>**2,700**</td></tr>
</table>

EMPLOYMENT, VACANCIES AND PROJECTED HIRES FOR TECHNICAL POSITIONS IN THE WASHINGTON STATE SOFTWARE AND COMPUTER INDUSTRY[11, 12]

Year	Current Employees	Current Vacant Positions	Planned New Positions
1998	27,147	4,893	36,763 (over 3 years)
2000	30,471	5,928	12,126 (over 2 years)

Source: Washington State Software Industry Challenges (1998)—Paul Sommers for the WSA *Findings of the 2000–2001 Workforce Study*—WSA

projected openings in the information technology industry over the next two years.

Even with the slowing economy at the end of 2000, overall workforce in the software and Internet industry still shows a 12% increase in technical employment over 2 years.

The decrease in planned new positions from the 1998 survey to the 2000 survey is an indication of the slowing of the technology sector. However, even with this slowing, the sector continues to predict moderate growth and a shortage of qualified workers.

The largest predicted vacancies for technical positions in the 2000–2001 survey are for programming/software engineer positions. Over the next two years, an estimated 5,199 new programming/software engineering positions will be added in Washington state software and Internet companies.[8, 9]

A major limitation of these technical employment estimates from the WSA workforce studies is that they are not indicative of the technical employment of all industries in Washington state, but instead just in the software and

More and more, the ability of our people to find and keep jobs in this high tech society—or for that matter, to function in daily life—depends on their ability to access and analyze information.
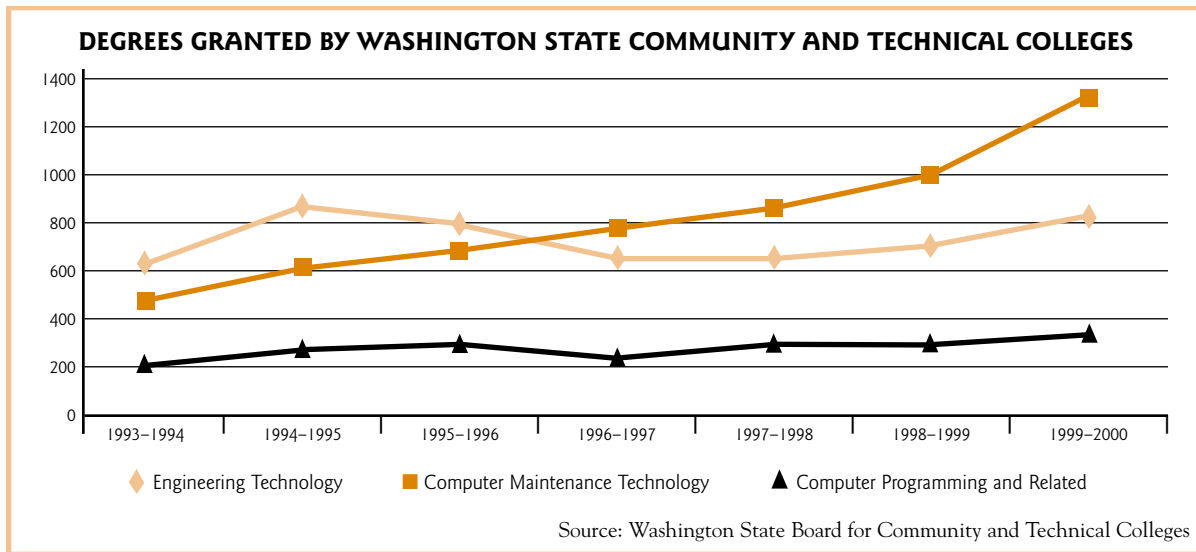*—Former Seattle Mayor Norm Rice, 1995[10]*

Internet industries. Those working in technical IT positions outside of the industry (i.e., the computer engineers for a bank, or the programmers for a business that is an online retail store) are not included in these employment estimates. For that reason, these numbers cannot be seen as an indication of the number of IT professionals currently working in Washington or the overall number of new IT positions that will be added in Washington over the next two years.

Between 1993 and 2000, community and technical colleges in Washington saw a steady increase in computer programming and maintenance degrees.

• Over the past seven academic years, there has been a 183 percent increase in the number of students graduating with computer programming and related degrees and certificates.

• There has been a 64 percent increase in students graduating with computer maintenance technology degrees and certificates.

The numbers shown here do not include those students who completed more than 45 credits but did not stay long enough to earn a degree. Follow-up with these students in the past has shown that many of them are re-entering the workforce without completing an actual degree. Therefore, they are often considered

Workforce Needs: Education, *continued*

DEGREES GRANTED BY WASHINGTON STATE COMMUNITY AND TECHNICAL COLLEGES

◆ Engineering Technology ■ Computer Maintenance Technology ▲ Computer Programming and Related

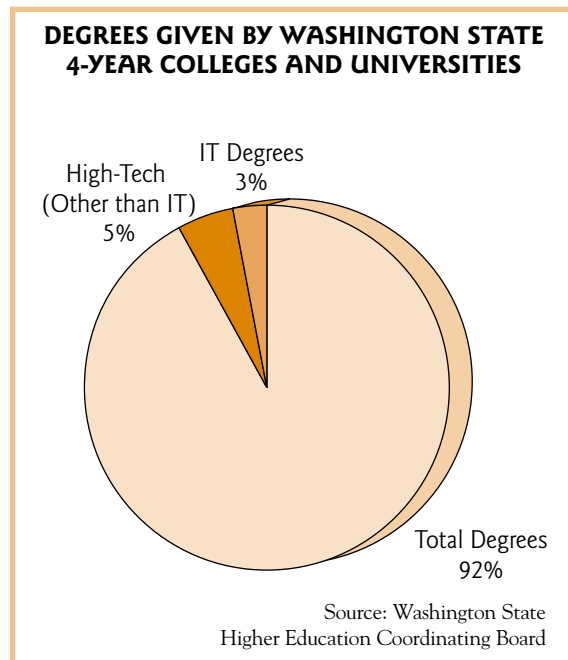Source: Washington State Board for Community and Technical Colleges

"completers" by the community college system and in workforce studies. In the 1998-1999 school year, this added about 1,700 students to the total number completing degrees and certificates at the community colleges in the state.

Washington State 4-year institutions gave a total of only 1038 IT-related degrees in the 1999-2000 school year. Individuals with these advanced degrees are the ones likely to drive technology development and management.

- Seventy-seven percent of these were bachelor's degrees

- Twenty percent were master's degrees.

- Just over one percent were doctorate degrees.

- Another two percent were "other" degrees, in this case post-baccalaureate certificates in information sciences and systems.

Of these degrees, 342 of them were business-related IT degrees, which are bachelors and master's degrees that focus on IT management and business issues.

DEGREES GIVEN BY WASHINGTON STATE 4-YEAR COLLEGES AND UNIVERSITIES

High-Tech (Other than IT) 5%
IT Degrees 3%
Total Degrees 92%

Source: Washington State Higher Education Coordinating Board

Growing the IT Industry

A healthy industry is creative and profitable, supported by and responsible to local communities. The following indicators look at local IT infrastructure for businesses and the economic impacts of IT on the local economy. In order to maintain healthy growth of the information technology sector, Seattle must create an environment that is conducive to the development of new businesses by providing the necessary infrastructure, incentives, and quality of life to encourage businesses to locate within the city.

Measurement	
New Information Technology City Business Licenses in 2000	**544**
Percentages of New Licenses that are for Information Technology Businesses	**7%**

The City business license classifications are limited, but in the year 2000, IT business licenses made up about seven percent of all new business licenses submitted to the City of Seattle.

The total number of new business licenses decreased by just over three percent between 1999 and 2000, but the percentage of new licenses that were for Information Technology only decreased by about 2/10 of a percent.

Year	Total New Licenses	New IT Licenses	Percentage
1999	7,969	580	7.28%
2000	7,699	544	7.07%
	Source: City of Seattle Department of Finance— License Enforcement Unit		

In the past few years, the country has seen a growth in the number of companies becoming publicly owned through initial public offerings (IPO's). The IPO market is extremely sensitive to the strength of overall industries, especially to the strength of the tech sector, making it a good proxy for measuring for the business climate in a region.

There was a drastic increase in the number of companies filing initial public offerings between 1998 and 1999. This increase can be seen very clearly in Seattle.

Measurement	
Number of IPO's filed by companies located in Seattle	
in 1998	**1**
in 1999	**12**
in 2000	**4**

In 1998, 1999 and 2000, Seattle companies made up more than half of those filing for IPO's in King County between January 1 and December 31. In 2000, Seattle companies dropped down to one quarter of those filing for IPO's in King County. However, if you subtract the five firms that withdrew before actually going public, Seattle firms continued to make up over a third of the firms filing in the county in 2000. Overall, the number of firms withdrawing their IPO's almost tripled in 2000, indicating the slowing economy and changing business climate nationwide. In Seattle, far fewer firms filed in 2000 than in 1999, but none of those filings had been withdrawn at the time of printing. Only one of the four had been priced by May of 2001.

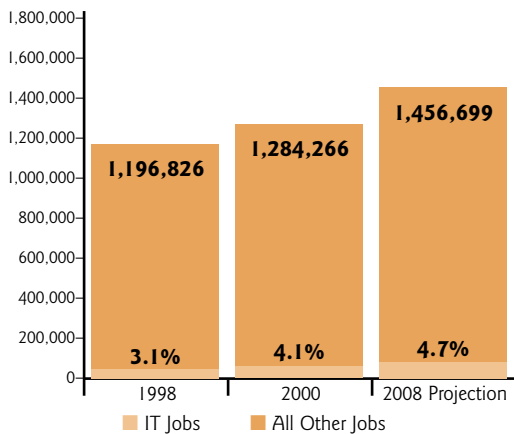| Year	Total IPO's Filed	Total in WA State	Total in King County	Total in Seattle
1998	477 (73*)	12	9 (3*)	1 (0*)
1999	718 (107*)	23	20 (0*)	12 (0*)
2000	713 (279*)	17	16 (5*)	4 (0*)
* indicates number that had been postponed or withdrawn as of May 14, 2001.				
			Source: http://www.ipo.com, as of May 14, 2001	

WorkForce: Local Employment

Information technology jobs and the IT industry both play a much larger role in the nation's economy than they did a decade ago. Despite the slowing in the technology sector in late 2000 and into 2001 the industry still continues to grow, albeit more moderately, and IT jobs remain in high demand.

Measurement

In 2000, IT jobs make up 4.1% of all jobs in King County.

In 1999, the IT industry provides 5.5% of jobs in King County and 3.6% of jobs in Seattle.

IT JOBS AS A PERCENTAGE OF TOTAL EMPLOYMENT IN KING COUNTY

- 1998: 1,196,826 — 3.1%
- 2000: 1,284,266 — 4.1%
- 2008 Projection: 1,456,699 — 4.7%

Legend: IT Jobs ■ All Other Jobs

Source: Washington Employment Security Department, Labor Market and Economic Analysis (LMEA) 1998–2008 Occupational Projections and Job Openings and 2000–2008 Occupational Projections and Job Openings[13]

There have been increases in information technology jobs as a portion of total jobs, though it remains a relatively low percentage overall.

In 1998, information technology professionals account for just over three percent of the total jobs in King County. By 2000, IT professionals increased to four percent of total jobs.

- There was an 8% increase in all jobs between 1998 and 2000.

- For IT professionals, there was a 42% increase during this time period.

Due to the way that the Washington Employment Security Department makes occupational estimates, there is no accurate information on information technology occupations in Seattle alone that is collected by the State. Organizations and trade associations within the industry have done their own estimates of the IT workforce, but these cannot be compared directly with state data.
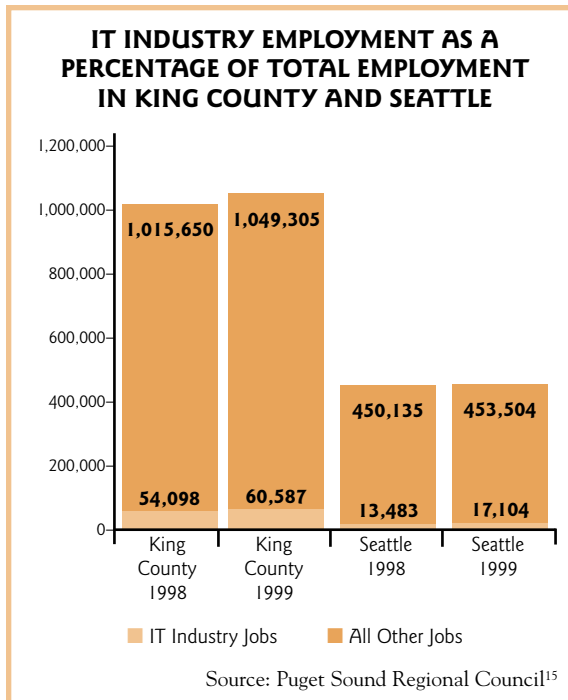
What attracts high tech business?

A study of location decisions of high tech companies in metropolitan Seattle included these findings:

- The top three location factors for high tech companies are:
  1. urban vs. suburban preference of founder and employees for amenities, workforce and housing;
  2. telecommunications infrastructure; and
  3. presence of top research institutions.

- Cities need to have the fundamental education and infrastructure in place to support the start-up and expansion of high tech industries.

—Source: The New Economy in Metropolitan Seattle: High Tech Firm Locations Within the Metropolitan Landscape[14]

Workforce: Local Employment, *continued*

IT INDUSTRY EMPLOYMENT AS A PERCENTAGE OF TOTAL EMPLOYMENT IN KING COUNTY AND SEATTLE

	King County 1998	King County 1999	Seattle 1998	Seattle 1999
All Other Jobs	1,015,650	1,049,305	450,135	453,504
IT Industry Jobs	54,098	60,587	13,483	17,104

Source: Puget Sound Regional Council[15]

MEDIAN HOURLY WAGE FOR KING COUNTY JOB SECTORS

Sector	Wage
Information Technology	$28.23
Average of All Sectors	$18.42
Professional and Related	$28.35
Management, Business Ops, and Financial Ops	$27.62
Sales and Related	$20.11
Construction, Extraction, and Maintenance	$18.39
Transportation and Moving Materials	$14.80
Production Occ	$14.23
Farming, Fishing, Forestry	$13.71
Office and Admin Support	$13.23
Service Ops	$12.63

Source: Washington State Employment Security Department, Labor Market and Economic Analysis Branch. Occupational Employment Statistics (OES) Wage Survey Data, representing wages for the 4th quarter of 1999[16]

Employment in the Information Technology industry grew rapidly both in Seattle and in King County between 1998 and 1999.

In 1998, jobs within the Information Technology industry made up just over five percent of the total jobs in King County. In 1999, this increased to about five and a half percent.
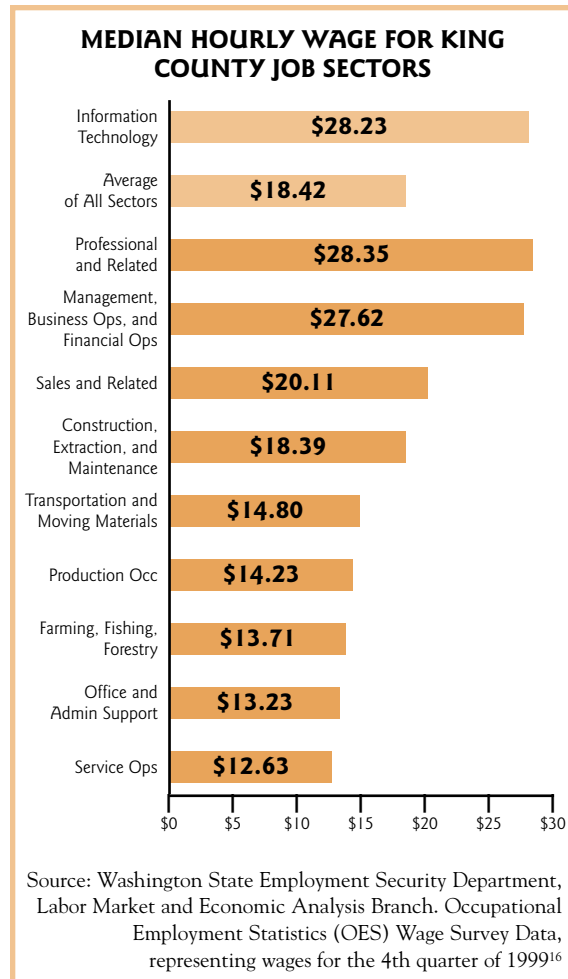
- Overall, jobs in King County increased by slightly less than four percent between 1998 and 1999. Jobs in the information technology industry in King County increased by 12 percent.

In 1998, jobs in the information technology industry accounted for just under three percent of the total jobs in Seattle. By 1999, this increased to just over three and a half percent. **The growth in the information technology**

Measurement

On average in King County, IT professionals' hourly wages are almost 50% higher than that of the average worker.

industry in Seattle was more than twice that of the growth in the industry in King County.

- Overall, Seattle jobs increased by only 1.5 percent between 1998 and 1999, while jobs in the IT industry in Seattle increased by about 27 percent.

In June of 2001, the Northwest Policy Center released a study entitled *Searching for Work that Pays*, a report that explores the gap between the number of living wage jobs being created in Washington and the number of people needing living wage jobs. According to this study, a *living wage* is a wage that allows family to meet their basic needs without resorting to public assistance and provides them some ability to deal with emergencies and plan ahead. In

Workforce: Local Employment, *continued*

Washington state, a living wage job in 1998 ranged from $10.65 an hour for a single adult to $17.52 an hour for a single adult with two children. In 2000, these numbers were $11.25 and $18.51.[17]

The mean hourly wages in 1999 reported for information technology occupations in King County range from $18.58 to $38.40. Only one IT position, computer support specialists, reports a mean hourly wage of less than $24.00 an hour. According to the definition of a living wage, all of the IT positions pay mean wages that are above the living wage for a single adult with two children. As shown in previous indicators, there is also a continued increase in new IT jobs, making this a desirable focus for job training and employment programs.

Another indication of whether our local workforce is meeting the needs of local companies is the number of foreign IT workers employed by Washington companies through the H-1B visa program. In 2000, Congress increased the number of H-1B visas available to companies across the U.S. There is strong debate about whether the use of foreign workers is necessary and appropriate for U.S. companies and a global marketplace or whether it restricts development and support for the local labor market and local community reinvestment.[18] Regardless of the debate, H-1B visas numbers contribute to two profiles: 1) overall workforce numbers and 2) reliance on labor outside the United States and potential loss to the local market.

If we are really going to find a way to make technology and society work, we have to bring together technological expertise and community concerns.

—Richard Conlin, Seattle City Council member

Workforce: Local Employment, *continued*

Measurement

Number of IT-related H-1B visas applied for by Washington Companies

14,889

In fiscal year 2000, 15,000 H-1B visas open-ings were certified for computer-related occu-pations in Washington, with 13,642 of those in King County. About 50 percent of the King County openings were for Seattle com-panies. H-1B visas of this type are allotted on a first-come, first-served basis. The effect that these visas have on the availability of profes-sional jobs for U.S. workers is unclear, but the implication is that it must have some effect. As a paper by the Benton Foundation on meeting workforce demands in the Year 2000 stated, "A recent Immigration and Naturalization Service (INS) survey found that 60% of H-1B petition-ers are IT workers. Applying the INS estimate to the current H-1B visa limit of 115,000 sug-gests that the H-1B visa program currently fills over 70,000 IT jobs, equivalent to 28% of the average annual demand for IT workers with at least a bachelors degree during 1996–1998."[19]
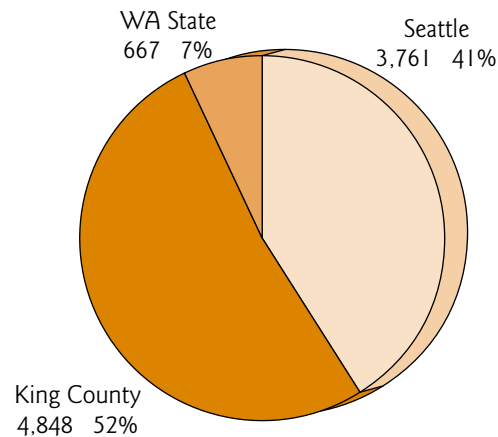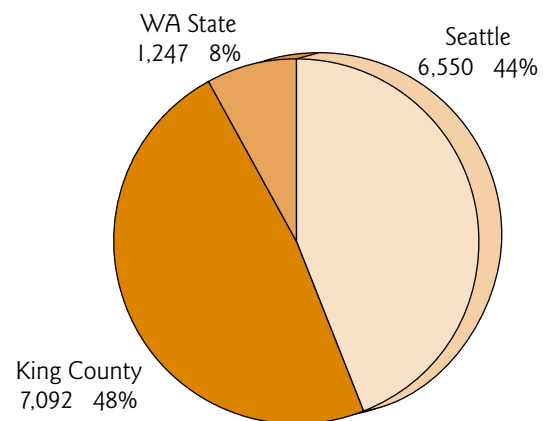
There was a sharp rise in the number of information technology related H-1B visa openings certified for companies in Washington between 1999 and 2000. Since H-1B visas are distributed annually on a first-come, first-served basis until the allotted num-ber is reached, many companies rush to submit applications early. In fiscal year 2000, the annual cap of 115,000 visas was reached in five months. It can be assumed that more companies would have submitted applications for H-1B visas had they been available.

- Overall, computer-related occupations account for nearly 54 percent of the total H-1B petitions.

- More than 47 percent of all approved peti-tions are for foreign workers in System Analyst or Programmer positions.

- In Washington, 77 percent of all approved H-1B visa applications in fiscal year 2000 were for information technology related positions (14,889 out of 19,395).

Preliminary reports from the Immigration and Naturalization Service in March, 2001 state that the number of H-1B visas approved during the first six months of fiscal year 2001 was down nearly 30 percent compared with the first six months of the previous year.[20]

H-1B VISA OPENINGS CERTIFIED[21] FOR INFORMATION TECHNOLOGY JOBS BY WASHINGTON STATE, KING COUNTY, AND SEATTLE COMPANIES

WA State 667 7%
Seattle 3,761 41%
King County 4,848 52%

FY 1999

WA State 1,247 8%
Seattle 6,550 44%
King County 7,092 48%

FY 2000

Source: U.S. Department of Labor, Office of Workforce Security—Employment and Training Administration

Use of the Internet for Local Business

Local small businesses are the core of our city's trade of goods, infrastructure and information. In the information age economy it is critical to consider what impact the Internet has on local business and whether they are able to stay competitive. We have used two measures to help track this issue. The results of our small business and technology survey will be added later. The first indicator here, whether residents have looked for local businesses online and what they found, provides a measure of the interest in supporting local business and the quality of the market. The second measure is concerned with using home Internet access to sell goods and services. This provides a look into entrepreneurial activities and new lifestyles.

Measurement

Percent of Seattle residents with Internet access who have looked for information about local businesses online — **55%**

More than half (55%) of respondents have sought information regarding local businesses online in the past year.

Most residents are indifferent about the information available on local businesses online—45 percent of those who have looked for information say they are neither satisfied nor dissatisfied with what they found.

- Only one-third (38%) of respondents who have sought information on local businesses are satisfied with the information that they found.

- Almost one in five residents (17%) are dissatisfied with the information available on local businesses on the Internet.

EXTENT OF USE OF THE INTERNET TO FIND INFORMATION ON LOCAL BUSINESSES

Have Sought
55%

Have Not Sought
45%
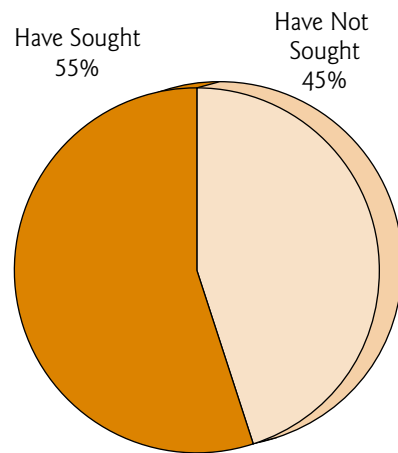
Source: 2000 Seattle IT Residential Survey

Use of the Internet for Local Business, *continued*

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Measurement

Percent of Seattle residents with Internet access at home who have used the Internet to sell goods or services

8%

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The Internet has fueled telecommuting, auction opportunities, day-trading, web development and hosting services—and increasingly businesses that people are running from their homes for primary or supplementary income. The opportunity to conduct business from home has many possible ramifications. It may enable parents to be available for their kids. It saves transportation and overhead costs, but could shift cost burdens to an employee. There are other social implications as well. For instance, working from home may decrease interaction with professional peers but increase neighbor time.

As a way to explore the expansion of micro-businesses on the Internet, residents with Internet access at home were asked if they have used the Internet to sell good or services from their homes. Although this is not an

accurate indication of all residents who have used the Internet to start home-based businesses, it does give a sampling of the way that the Internet is creating new entrepreneurial opportunities for Seattle residents.

Overall, only a small percentage of residents are using the Internet to sell goods or services from their homes. However even this small percentage indicates that more than 40,000 residents have used the Internet to start some sort of micro-business from their home.

There are few differences in demographics between those who have used the Internet for this purpose and those who have not.

- Men are twice as likely as women to have used the Internet to sell goods or services from their homes.

- Those between 18 and 35 are more likely to have used the Internet in this way than those over 35.

- Those without any college education who have an Internet connection at home are more than twice as likely to have used the Internet to sell goods and services as those with a college education.

USE OF INTERNET TO SELL GOODS OR SERVICES FROM HOME

(Of the 72% of Residents with Internet Access at Home)

Yes
8%

No
92%
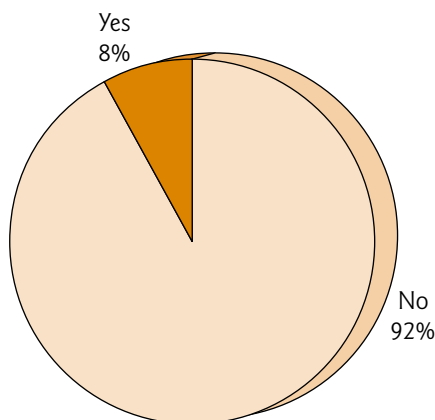
Source: 2000 Seattle IT Residential Survey

Notes

1 For a full listing of SIC codes and their definitions, see http://www.osha.gov/cgi-bin/sic/sicser5.

2 For the Dictionary of Occupational Titles, see http://www.wave.net/upg/immigration/dot_index.html.

3 C. A. Meares and J. Sargent, *The Digital Workforce: Building Infotech Skills at the Speed of Innovation* (U.S. Department of Commerce, Office of Technology Policy: June, 1999).

4 Technical Writers are not included in the DOC Office of Technology Policy definition.

5 The Benton Foundation, *Losing Ground Bit by Bit: Low-Income Communities in the Information Age* (June 1998), 4.

6 College Board as reported through e-mail correspondence with Tim Washburn, Executive Director of Admissions and Records, University of Washington, December 26th, 2000.

7 Washington Software Alliance, *Findings of the 2000-2001 Workforce Study,* 2001, 14.

8 Washington Software Alliance, 10.

9 This data is from the Washington Software Alliance which uses a narrower definition of the IT industry than used in other sections of this report (see Defining IT Industry and Occupations section). The numbers on technical employment/technical positions referred to in this indicator were collected through private interviews with companies, and therefore were not confined to the State occupational classifications. These Technical Positions are Programming/Software Engineers, Database Development/Administration, Quality Assurance, Network Design and Administration, Enterprise Systems Analysis/Integration, Technical Support, Web Development and Administration, Digital Media, and Technical Writing.

10 Mayor Norm Rice, "Global Connections, Local Impacts," remarks to Puget Sound Regional Conference on Telecommunities, January 6, 1995.

11 Paul Sommers, *Washington State Software Industry Challenges*, (Seattle, WA: Northwest Policy Center, October, 1998) 18.

12 Washington Software Alliance, 9.

13 Projections from the Washington Employment Security Department are based on information gathered from employers in the Occupational Employment Statistics Survey conducted cooperatively by the Washington State Employment Security Department and the U.S. Department of Labor, Bureau of Labor Statistics. Some limitations of this method include:

- The occupational projections are based on survey data and industry employment estimates. As a result, some degree of error is inherent in all numbers. The smaller the base year number the larger the possible error range.

- Only the occupations with ten or more workers in the base year are included in this listing.

- In instances where state and the sum-of-the-area projections differed, the area projections were adjusted to the state totals.

14 Paul Sommers and Dan Carlson, *The New Economy in Metropolitan Seattle: High Tech Firm Locations Within the Metropolitan Landscape,* 2000. Report published by the Daniel J. Evans School of Public Affairs, University of Washington for The Brookings Institution on Urban and Metropolitan Affairs and City of Seattle Office of Economic Development.

15 Some limitations of this data include:

- Covered employment typically represents around 85% of all jobs in the region.

- All employment for a business record is reported under a single SIC code. So, for example, if a business making wood products also employs janitors, and accountants, they would all likely be included in the job totals reported for the wood products manufacturing SIC code, unless the company reports them separately.

- Some totals for multiple sites are still reported at a single location.

16 Wages reported include base rate, cost of living allowances, guaranteed pay, hazardous-duty and incentive pay (includes commissions and production bonuses), on-call pay and tips. Wage data does not include back pay, stock and options bonuses, jury duty pay, vacation pay, overtime pay, severance pay, shift differentials, nonproduction bonuses and tuition reimbursements.

17 Northwest Policy Center, Northwest Federation of Community Organizations, and Washington Citizen Action, *Searching for Work that Pays, 2001: Washington*, Northwest Job Gap Study, June 2001.

18 There have been many commentaries written on the H-1B visa program. A lead voice against increases in the H-1B visa program is the Washington Alliance of Technology Workers, a part of the Communication Workers of America (see www.washtech.org). On the other side of the debate is the Information Technology Association of America, which has supported past increases (see www.itaa.org/itserv/immipolicy.htm).

19 Benton Foundation, "Meeting Workforce Demands in the Digital Economy," from the Digital Divide Network, 2001 (http://www.digitaldividenetwork.org/content/stories/index.cfm?key=6).

20 Carrie Johnson, "High-Tech Visa Approvals Down From Last Year," *Washington Post,* 21 March 2001, sec. E, p. 1.

21 Openings certified only indicate the number of H-1B openings that were certified for work and does not mean that this many H-1B workers were actually employed. Each year the Department of Labor certifies more openings than are actually used by employers.